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# Proceedings of the International Environmental Information Workshop Held at Washington, D.C. on May 28-30, 1975

National Oceanic & Atmospheric Administration, Silver Spring, Md

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U.S. Department of Commerce
Washington, D.C., May 28-30, 1975

Washington, D.C.
January 1976

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Environmental Data Service

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The International Environmental Information Workshop was held to promote the exchange of environmental data and information between National Oceanic & Atmospheric Administration (NOAA) of the United States and Environment Canada. These meetings were held primarily to enable the participants to acquaint each other with their specialized environmental data and information services and library resources so guidelines and procedures for the effective exchange and sharing of resources could be developed preparatory to the formalization of exchange agreements.

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# Proceedings of the International Environmental Information Workshop

U.S. Department of Commerce
Washington, D.C., May 28-30, 1975

Sponsored by
U.S. National Oceanic and Atmospheric Administration
U.S. Environmental Protection Agency and
Environment Canada

Washington, D.C.
January 1976

U.S. DEPARTMENT OF COMMERCE
Rogers C.B. Morton, Secretary

National Oceanic and Atmospheric Administration
Robert M. White, Administrator

Environmental Data Service
Thomas S. Austin, Director

## FOREWORD

The International Environmental Information Workshop of May 28-30, 1975, was sponsored by the National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce. The principal participants were the Environmental Data Service of NOAA and the Data and Information Services of Environment Canada. The U.S. Environmental Protection Agency and the Subsecretariat of Environmental Improvement of Mexico sent invited observers to attend these meetings held in Washington, D.C. The free exchange of information is expected to lead to the development of international agreements for the regular exchange and sharing of environmental data and information.

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Mr. Robert V. Ochinero, Director

National Climatic Center . . . . . 3
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INTERNATIONAL ENVIRONMENTAL INFORMATION WORKSHOP

U.S. Department of Commerce
Washington, D.C.
May 28, 29, 30, 1975

National Oceanic and Atmospheric Administration
Environmental Protection Agency
Environment Canada

Wednesday, May 28
Room 2062

Review of NOAA Data and Information Centers and Services

| | |
|---|---|
| 8:00-8:20 A.M. | Welcome<br>Environmental Data Service overview<br>Dr. Thomas S. Austin |
| 8:20-8:40 | Environmental Science Information Center overview<br>Dr. Joseph F. Caponio |
| 8:40-9:00 | National Oceanographic Data Center overview<br>Mr. Robert V. Ochinero |
| 9:00-9:20 | National Climatic Center. and satellite imagery overviews<br>Mr. Herschel L. Suits |
| 9:20-9:40 | Break |
| 9:40-10:00 | Center for Climatic and Environmental Assessment overview<br>Mr. Malcolm Reid |
| 10:00-10:20 | National Geophysical and Solar-Terrestrial Data Center overview<br>Mr. Bruce J. Grant |
| 10:20-10:40 | Translations overview<br>Mr. Milton M. Rose |
| 10:40-11:00 | Question and answer period |

11:00 A.M.-2:00 P.M. Lunch

Speaker: Mr. Fitzhugh Green
Associate Administrator, EPA

Room 6802

Review of Environment Canada Data and Information Centers and Services

2:00-2:20 Environment Canada overview
Mr. Bernie G. Brulé

2:20-2:40 Environment Canada Library Services
Mrs. Agatha Bystram

2:40-3:00 Atmospheric Environment Service overview, Information Centre and Data Gathering
Mr. T. Lloyd Richards

3:00-3:20 Fisheries and Marine Service overview
Dr. R.M. McMullen

3:20-3:40 Marine Environmental Data Service
Mr. Henry A.C. Jones

3:40-4:00 Break

4:00-4:20 Fisheries and Marine Service Scientific Information Directorate
Dr. Jeff Watson

4:20-4:40 WATDOC
Miss Janice Heyworth

4:40-5:00 Question and answer period

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Thursday, May 29

8:00-11:30 A.M

## Working Group Sessions

| | |
|---|---|
| Conference Room D | Group 1: Public Information |
| Room 6802 | Group 2: Library and Documentation Services |
| Conference Room A | Group 3: Specialized Information Services |
| Conference Room B | Group 4: Specialized Data Services |
| 11:30 A.M.-2:00 P.M. | Lunch |
| 2:00-4:00<br>(same rooms as in A.M.) | Discussion and summarizations by the groups |
| 4:00-5:00<br>Room 6802 | Final assembly reports, concluding remarks |

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Friday, May 30

| | |
|---|---|
| 9:00-12:00 A.M.<br>Room 6802 | Informal discussion of UNEP/IRS focal point activities |

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| Dr. Augustine Y. M. Yao<br>Research Scientist<br>Assessment Division<br>Center for Climatic and<br>Environmental Assessment | NOAA |

# INTERNATIONAL ENVIRONMENTAL INFORMATION WORKSHOP

May 28-30, 1975
Washington, D.C.

## INTRODUCTION

The International Environmental Information Workshop was held to promote the exchange of environmental data and information between National Oceanic and Atmospheric Administration (NOAA) of the United States and Environment Canada. The U.S. Department of Commerce's NOAA hosted these meetings, which were co-chaired by Dr. Joseph F. Caponio of NOAA, Mr. Bernie G. Brulé of Environment Canada, and Ms. Dolores Gregory of EPA.

These meetings were held primarily to enable the participants to acquaint each other with their specialized environmental data and information services and library resources so guidelines and procedures for the effective exchange and sharing of resources could be developed preparatory to the formalization of exchange agreements.

Each major data center and library resource was described by the principal participants, and workshop groups met to define these resources in greater detail.

Among the 50 invited participants and observers were 37 from United States agencies, 11 from Canada, and 2 from Mexico. Officials of major Canadian and United States agencies described their centers and operations. Four working groups, and informal groups, met to discuss mutual problems and to summarize their findings.

Another conference is planned, after all participants have been able to assimilate the information presented at this workshop, to further develop and perhaps arrive at formal agreements for international exchange.

It is hoped that this conference has resulted in better knowledge on the part of the participants of the capabilities, resources, and problems of each nation's resources in environmental data and information.

## ENVIRONMENTAL DATA SERVICE

Thomas S. Austin. Director

The Environmental Data Service (EDS) is NOAA's environmental data management component. A major line organization, EDS acquires, processes, archives, analyses, and disseminates worldwide environmental information, data, and products for use by commerce, industry, the scientific and engineering community, the general public, and Federal, State, and local governments. The kinds of environmental data treated are solid earth, marine, atmospheric, solar, and aeronomy. EDS also provides guidance on applied research to improve environmental data and information services, provides World Data Center facilities, and editorial, publishing, library, and information services relevant to NOAA's missions. To accomplish its assigned responsibilities EDS operates six centers: National Climatic Center, National Oceanographic Data Center, National Geophysical and Solar-Terrestrial Data Center, Center for Experiment Design and Data Analysis, Center for Climatic and Environmental Assessment, and the Environmental Science Information Center. A Branch of the National Climatic Center is responsible for management of the NOAA-generated satellite data. (Most of these are described by succeeding speakers.) Each center furnishes support for specific mission responsibilities of NOAA, and each interacts with other EDS centers and other data and information centers both in the United States and abroad to supplement NOAA and national capabilities in the environmental sciences.

Substantial efforts are made by each of these centers to acquire, by exchange or purchase, data and information from counterpart institutions and centers in academic, commercial, and agency circles in the United States and other nations. Telecommunications links to collections external to NOAA can and, in some cases, do permit rapid exchanges of data and information. NOAA's World Data Center-A activities are helpful to NOAA and the United States. Other international agreements, such as those for which this workshop will provide some background, should benefit all parties concerned.

## ENVIRONMENTAL SCIENCE INFORMATION CENTER

Joseph F. Caponio, Director

The Environmental Science Information Center (ESIC) provides library information and editing and publishing services for all of NOAA. ESIC's Scientific and Technical Publication Division prepares for publication the results of NOAA's scientific investigations and technological developments. Specific fields include oceanography, meteorology, fisheries and marine biology, geodesy and solid earth physics, aeronomy, coastal zone management, and aeronautical and marine charting and mapping. The Library and Information Services Division maintains its service activities in proximity to user groups. This division also exchanges information with other national and international library and information groups, such as

universities, industrial firms, government agencies, and research and development organizations. The NOAA library system is enlarging its capabilities for computerized cataloging, bibliographic searches, and selective dissemination of information discussed in the workshop summary on Specialized Information Services.

## NATIONAL OCEANOGRAPHIC DATA CENTER

Robert V. Ochinero, Director

The National Oceanographic Data Center (NODC) is the NOAA and U.S. national facility for the acquisition, processing, archiving, and dissemination of physical, chemical, and biological oceanographic data. The NODC also provides facilities for World Data Center-A (Oceanography). The center analyses data and prepares descriptive products (graphical presentations, maps, and charts) for use by those engaged in various aspects of oceanography. NODC houses the world's largest known collection of marine data. Examples of the kinds of data handled by the center are (1) bathythermograph data in analog and digital form, (2) station data for surface and serial depths, including values of temperature, salinity, oxygen, phosphate, phosphorus, nitrates and nitrites, silicates, and pH, (3) continuous recordings of salinity, temperature, and depth in digital form, (4) surface current data, and (5) biological data on plankton, chlorophyll, and rates of productivity, and papers on marine biology.

The NODC also developed the ENDEX (Environmental Data Index), which lists the contents (and formats) of other data collections. ENDEX, which is a referral service for locating environmental data, should be a good vehicle for exchange of information between the United States, Canada, and other nations. This and similar systems are discussed in the summaries of the Workshops on Specialized Information Services and on Specialized Data Services.

NODC and the Lake Survey Center of the NOAA National Ocean Survey are currently exchanging data with Canada and other nations, primarily through informal arrangements. It is hoped that further meetings of this group will lead to formal bilateral or multilateral exchange agreements that will regularize the exchange of mutually beneficial data and information.

## NATIONAL CLIMATIC CENTER

Herschel L. Suits, Chief, Information Services Division

The National Climatic Center (NCC) is the largest of the Environmental Data Service's family of centers. In 1951, the Weather Bureau, Air Force, and Navy agreed to establish the National Weather Records Center--an outgrowth of the New Orleans tabulating unit which was set up during the early stages of the second World War to conduct climatological investigations for strategic decisions of the Armed Forces. A search for a home for the new National

Weather Records Center led to the Arcade Building (now known as the Federal Building) in Asheville, N.C. Today's climatic complex in Asheville consists of a cooperative operation between the National Climatic Center, the Air Force Data Processing Division of the Environmental Technical Applications Center, and the Naval Weather Service Detachment. Even though these three organizations have different parent agencies their commonness of function and purpose has led to a very close working relationship.

The National Climatic Center consists of the Director's Office, the science advisory staff, and five operational divisions (Data Operations, ADP Services, Climatological Analysis, Information Services, and Administrative and Technical Services). The NCC is responsible for: Receipt, quality control, processing, publication, archiving, and recall of climatological data; coordination of the analysis of past meteorological data for NOAA, other Government agencies, and the general public to accommodate all user requirements for climatological data, including special studies and statistical analyses; and management of the National Program of Climatological Data Recall. The NCC works closely with the military in meeting this special requirement.

The NCC is also responsible for providing on request facilities, data processing support, and expertise, for World Meteorological Organization Programs (e.g. GARP and GATE), and coordination (through WDC-A) of the international exchange of climatic data.

As custodian of all U.S. weather records, NCC obtains the data generated in the observational networks of the National Weather Service and its cooperators, the weather services of the U.S. Air Force and Navy, the U.S. Coast Guard, the Federal Aviation Administration, and from many other cooperators.

For many years, the input to NCC was, traditionally, mailed-in copies of manuscript and autographic records. With advancing technology this has evolved to a changing and complex mixture of mailed-in manuscript forms and publications from many sources, film of satellite images, and paper and magnetic tape digital data from U.S. and foreign sources. Once the records are received, quality controlled, and archived at NCC, they become the property of the United States Government and are subject to the use and retention schedule prescribed by NOAA.

The data files include:

a. Hourly surface observations from some 3,000 land stations in the United States.

b. Daily surface observations from about 12,000 cooperative observing stations in the U.S. Instruments and the instrument shelter are furnished to these stations by the National Weather Service. Data recorded include maximum temperature, minimum temperature, and precipitation for the 24-hour period ending at the time of observation. A few special stations measure evaporation,

soil moisture, and soil temperature. Most of the cooperative observers receive no pay for their services.

c. Hourly precipitation data from recording stations.

d. Upper air observations from approximately 125 stations. (Most stations make two observations each day).

e. Surface weather observations are also available from ships at sea, including those operated by the United States Navy, United States Coast Guard, United States merchant marine, and some special weather ships that remain "on station" in selected ocean areas.

f. Permanent observation buoys that radio weather conditions to land receiving stations automatically and on a regular schedule.

g. Radar - log sheets and scope photos from about 50 weather radar stations in the United States which maintain continuous surveillance on weather conditions.

h. Maps and charts from NMC and the military services.

i. Data tabulations and summaries.

j. Solar radiation data.

k. Atmospheric turbidity, and

l. Satellite data, in both visual image and digital form, from satellite systems such at ITOS (Improved Tiros Operational Satellite), SMS/GOES (Geostationary Operational Environmental Satellite), and ERTS (Earth Resources Technology Satellite).

The process to which the NCC data files are subjected is now evolving at an accelerating rate. It consists essentially of an inventory digitization of selected data, summarization of selected parameters, publication of summarized data in local, State, and national publications, distribution of the published material, filing the data and summaries in a form for rapid retrieval,and preparation of special analyses for data users.

The Air Force and NCC jointly manage a single computer installation for processing data. The Naval Weather Service contracts with NCC for their climatic data processing needs.

NCC maintains a computerized data base of meteorological data on magnetic tape. The data are separated into types such as hourly surface observations, daily summaries, upper air observations, and marine observations. Each type is assigned a specific tape format and a unique tape data family designation. NCC has in excess of 40,000 reels of magnetic tape in the tape library, containing some $4.8 \times 10^{11}$ characters of data. The yearly accession rate to the tape library is approximately 1,000 reels

excluding special project data. However, in the past year, the NCC accessioned more than 10,000 reels of digital data because of the large number of tapes from the GATE and IFYGL Projects. Publications available by subscription include, "Local Climatological Data", published monthly for approximately 300 cities and towns; "Local Climatological Data With Comparative Data," an annual publication with tables of normals, means, extremes; "Climatological Data" by States, monthly, and annually; "Climatological Data, National Summary," monthly and annually; "Hourly Precipitation Data," by States, monthly; "Storm Data", by States, monthly; "Monthly Climatic Data for the World" (Sponsored by the World Meteorological Organization); "Northern Hemisphere Data Tabulations - Sea Level Charts and 500-millibar Charts," now available on microfilm; "River Forecasts," published annually for over 600 gage station daily values; "High Altitude Meteorological Data" from rocket soundings, gun probes, etc.; and "Atmospheric Turbidity and Precipitation Chemistry Data for the World."

Non-periodic publications include such things as "Climates of the States," presently being revised for all States; "World Weather Records"; "Airport Climatological Summaries;" and numerous atlases and special publications about the various big experiments.

These publications - totaling 37,000 pages of prepared copy per year (for a single issue of each) when routinely mailed to 77,000 subscribers amount to 27,500,000 pages of climatic information regularly distributed to data users. Non-subscription distribution, to answer specific questions for climatic data, amounts to an additional 2 million pages per year. When publications for the U.S. Navy, the National Geophysical and Solar-Terrestrial Data Center, and other Environmental Agencies processed at NCC are considered, the single-copy page total nearly doubles to 72,160 pages per year and the annual publication of environmental data rises from 27 to over 44 million pages per year. Special publications are prepared less frequently. The main special publications are the several under the Periodic Summarization of the Climate Program (PERSUM).

NCC has initiated a long-term project to place climatological publications series in microfiche. All series are being filmed from initial publication date through 1973. Approximately 1,200,000 pages will be put on nearly 22,000 microfiche.

While the wide dissemination of climatic data by publication is a basic part of the NCC operation, a rapid response service for non-routine user requests is probably more evident to the casual observer. The National Climatic Center provides specialized services to many users. For architects, designers, builders, and planners, the climatic data base serves as essential resource material for design criteria of all weather-influenced structures. For researchers in Government, private institutions, and industry; for atmospheric scientists and engineers; for agriculturalists, biologists, environmentalists; and for the general public, the NCC is a unique source of historical weather information--much of it recycled data initially collected for an immediate operational problem, but preserved for subsequent uses. In a typical year, the NCC provides 500,000 copies of weather records in answer to requests; 25,000 certifications for court use; answers 20,000 phone

inquiries; replies to 30,000 letter inquiries; sends 3.000 reels of magnetic tape of weather data to outside users; and furnishes users with 500,000 feet of microfilm and 10,000 sheets of microfiche. In recent years there has been a dramatic increase in specialized users services at NCC. Last month (April 1975), the NCC completed the highest monthly total of responses to user requests on record---5,067. The Satellite Data Services Branch located in the World Weather Building, Camp Springs,Md., is the NCC unit that archives satellite data. This branch was activated on October 29, 1974, upon consolidation of the satellite data archival and customer service functions of the National Climatic Center and the National Environmental Satellite Service. Current plans are to develop this activity into a separate EDS center in FY-77. The unit will then be called the National Oceanic and Atmospheric Satellite Data Center (NOASDC). Together NCC and NOASDC will archive and disseminate both earth and space acquired meteorological data.

The ITOS System-Improved Tiros Operational Satellite System (often referred to as the NOAA series of satellites) became operational in 1970. This system is designed to provide global weather surveillance once each day. These satellites are earth oriented and sun synchronous. They fly in an orbit that passes near both poles. Each satellite is equipped with a two channel scanning radiometer system which provides visual and infra-red imagery on a global basis. The satellites are also equipped with Solar Proton Monitor Sensors which provide useful data for estimating the degree of activity of sun spots which can affect radio communications.

The CDA (Command and Data Acquisition) stations send commands to and receive data stored on magnetic tape from the satellite while it is within line of sight communication range. The data are then relayed to an analyses facility near Washington, D.C., for use in weather forecasting operations and other special projects.

The GOES System--Geostationary Operational Environmental Satellite System--utilizes satellites which fly in an equatorial orbit at an altitude of 22,300 miles and at a speed matching that of the earth's rotation. Thus, these satellites are stationary above a pre-determined point on the equator and view a large disk of the earth continuously. At the present time, one is stationed at 75°W and another at 135° W longitude. Each is equipped to obtain measurements in both the visible and infrared parts of the spectrum.

The Earth Resources Technology Satellite (ERTS) data are provided to our archives by NASA and are used to satisfy some retrospective needs of oceanographers, hydrologists, and meteorologists.

## CENTER FOR CLIMATIC AND ENVIRONMENTAL ASSESSMENT

Malcolm Reid, Center for Climatic and Environmental Assessment

The Center for Climatic and Environmental Assessment (CCEA) was established in 1974 to deal with climatology related to socio-economic activities. CCEA is divided into three sections as follows:

a. The Model Division, at the University of Missouri, Columbia, is responsible for developing statistical models which provide a quantified relationship between climate-associated fluctuations and socio-economic events. This division is currently developing statistical winter wheat crop yield estimates for the Great Plains States.

b. The Washington-based Climatic Assessment Division is responsible for assessing large-scale climatological variations in terms of their impact on national and international resources, and in facilitating communication with other government agencies.

c. The CCEA element at LACIE (Large Area Crop Inventory Experiment) is the NOAA representative at the joint U.S. Department of Agriculture, NOAA, NASA program at the Johnson Space Center in Houston, Tex. This group is responsible for studying the degree to which computer-assisted analyses of data acquired from archives and space can contribute to the forecasting of crop production.

CCEA's primary mission is to assist the nation to respond more effectively to the full range of climate-induced problems by providing tailored consultant services and products to Government agencies concerned with the impact of the environment on socio-economic programs and policies. Its specific objectives are to model the environmental impacts on food, energy, and other resources, and to serve as a focal point for climatic impact information.

## THE NATIONAL GEOPHYSICAL AND SOLAR-TERRESTRIAL DATA CENTER

Bruce J. Grant, Marine Geology and Geophysics Branch

The National Geophysical and Solar-Terrestrial Data Center (NGSDC), one of six major facilities of NOAA's Environmental Data Service, was formed in 1971 by the merger of the Aeronomy and Space Data Center and the National Geophysical Data Center. All elements of the NGSDC are located in Boulder, Colo., with the exception of the Marine Geology and Geophysics Branch, presently in Washington, D.C., but scheduled to be relocated to Boulder in July, 1975.

The NGSDC combines NOAA's data activities in the fields of seismology, geomagnetism, marine geology and geophysics, solar activity, interplanetary phenomena, the ionosphere, cosmic rays, and aurorae and airglow in a single data center. Its activities are conducted through the Solid Earth Data

Services Division, Solar-Terrestrial Data Services Division, Data Studies Division, and Data Operations Group.

Data originating from major national and international sources are maintained in NGSDC data banks and are made available at cost or through exchange programs in a variety of formats ranging from copies of original data records through data tabulations and summaries to sophisticated computer produced products.

The NGSDC has data management responsibilities for many international programs such as the International Decade of Ocean Exploration (IDOE), the International Program of Ocean Drilling (IPOD), the Franco-American Mid-Ocean Undersea Study (FAMOUS), and many others. The NGSDC also is responsible for Solid Earth Sciences under the auspices of the National Academy of Sciences and in accordance with the international guides for data exchange of the International Council of Scientific Unions.

## NOAA TRANSLATIONS PROGRAM

Milton M. Rose, Chief, Language Services Division

The Language Services Division of the Office of International Fisheries, National Marine Fisheries Service provides translations and information on foreign literature and translations to all NOAA elements, Government and State agencies, industry, and academic circles. It examines and screens foreign publications in the fields of interest to NOAA and arranges for their translation. The Division also serves as a clearinghouse for translated literature in fisheries, oceanography, and other topics of interest to NOAA activities.

Bibliographic citations are maintained on completed and in-progress translations and files of manuscript and printed translations. As of April 1975, our holdings consisted of about 45,000 bibliographic cards and over 38,000 completed translations. Three publications are prepared regularly to inform users of new foreign literature and current translations. The titles of these publications are:

a. Translated Tables of Contents of Current Foreign Fisheries, Oceanographic, and Atmospheric Publications.

b. Received or Planned Current Foreign Fisheries, Oceanographic, and Atmospheric Translations.

c. Survey of Foreign Fisheries, Oceanographic, and Atmospheric Literature.

All translations produced by the Language Services Division or other NOAA elements, and those purchased or obtained through exchanges, are announced in those publications. Users are also made aware of new foreign literature and translations through announcements, reviews, and abstracts appearing in NOAA publications such as Marine Fisheries Review, Fishery

Market News Reports, and industry publications. Printed translations produced for NOAA are furnished without charge while the supply lasts; manuscript translations are loaned to users.

Requests for translations and information increased from 7,000 in 1967 to 44,000 in 1974. During 1974, 35 percent of requests were generated by industry, 30 percent by NOAA elements, 25 percent by State and other agencies, and 10 percent by academic circles and others. To obtain information on foreign literature and translations of specific articles or monographs, requesters should provide us with a detailed bibliographic description of the publication in question. There is no charge for providing translations and information.

The Division acts as a national clearinghouse for translations in the fields of interest to NOAA activities. It is the focal point for the worldwide coordination of translations in those topics. This function results in important monetary savings because it avoids duplication in translation and provides our users with information on completed and in-progress translations produced by other organizations and institutions. Other activities of the Language Services Division include the production of bibliographies on specific topics, glossaries, dictionaries, foreign literature scans and surveys, and language support for international conferences, meetings, and negotiations.

Programs for extensive exchange of translations and publications have been established with many leading national and foreign institutions and organizations such as FAO, Marine Fisheries Service of Canada, British Lending Library, CSIRO, and others. All U.S. universities as well as Government and State agencies send us one copy of each translation they produce in our fields of interest. This material is provided in exchange for our releases, translations, and clearinghouse services. The translations obtained through exchanges represent 60 percent of our holdings. Foreign publications, most of them available through exchange only, provide NOAA with current information and new material for translation.

The Division sponsors or produces translations for NOAA only. Literature not needed for immediate use is translated in foreign countries where special foreign currencies (monies generated from the sale of agricultural commodities to foreign countries under Public Law 480) are available for this purpose. At present, translations are being done for us in India, Pakistan, Tunisia, United Arab Republic, Poland, and Israel. The completion time for these translations varies from 4 months to 2 years, depending on the subject and length of the item to be translated, and on whether it is to be printed or produced in manuscript form only. Translations needed for immediate use are done by the Division personnel or by local contractors.

For information on translations and on our activities, please write or telephone:

Language Services Divison, F43
Office of International Fisheries
National Marine Fisheries Service, NOAA
U.S. Department of Commerce
Washington, D.C. 20235

Our telephone number is: area code 202-634-7456 or 7457.

## GOVERNMENTAL RESPONSIBILITIES IN ENVIRONMENTAL MANAGEMENT IN CANADA (A FEDERAL PERSPECTIVE)

Bernie G. Brulé, Advisor, Environment Canada

Environmental Management in Canada is the responsibility of all levels of government--federal, provincial, and municipal. The federal government has powers to deal with specific subjects that affect resources and certain powers related to its own property. Constitutionally, it has legislative power over navigation and shipping, sea coast and inland fisheries and migratory birds, and over the Northwest and Yukon Territories. It has legislative responsibilities with regard to interprovincial and international trade and undertakings, agriculture, trade and commerce, and Indians and Indian lands. Certain general powers can influence water development even more than specific ones. These include power to legislate for "peace, order and good government", banking, taxation and the public debt, census and statistics, defence and external affairs including international waters, and the criminal law.

Under the British North America Act of 1867, the provincial governments were given major legislative responsibilities in areas that involve resource management. Ownership of the natural resource including water is primarily provincial, and this forms the major source of their legislative and managerial authority. Provincial ability to legislate in water matters also stems from their exclusive jurisdiction over property and civil rights matters of a local and private nature, and local works and undertakings. The provinces often assign certain water related responsibilities to municipal and local governments in areas affecting sewage treatment, land-use planning and water supply systems.

These spheres of responsibility are obviously not entirely independent and many intergovernmental arrangements exist to coordinate environmental management actions. Indeed much federal legislation, such as the Canada Water Act, and federal agency actions are designed to be complementary to and cooperative with provincial actions and responsibilities.

The Department of Environment (DoE) was established by the Government Organization Act, 1970 and came into being on June 11, 1971. Also known as Environment Canada, the Department was created to amalgamate major federal responsibilities concerning the protection, preservation and enhancement of environmental quality and related renewable resources.

Environment Canada brings together major Federal Government services under two main components, Fisheries and Marine Service and Environmental Services.

The Department is headed by the Honorable Jeanne Sauvé, Minister of the Environment and Minister of Fisheries. She is assisted by the Honorable Roméo LeBlanc, Minister of State (Fisheries), in carrying out her responsibilities as Minister of Fisheries for Canada.

Responsible for the management of the Department is Mr. J.B. Seaborn, Deputy Minister. Reporting to him are two Senior Assistant Deputy Ministers. The head of Environmental Services has under his jurisdiction Environmental Protection, Environmental Management, and Atmospheric Environment. Mr. K.C. Lucas for the Fisheries and Marine Service has under his jurisdiction Fisheries Management and Ocean and Aquatic Affairs. Also reporting to the Deputy Minister is Mr. W. Evan Armstrong, Assistant Deputy Minister, Planning and Finance Service.

## GENERAL FUNCTIONS OF THE SERVICES

### Fisheries and Marine Service

(Details on the Fisheries and Marine Service are given in the paper by Dr. R. M. McMullen.)

### Environmental Services

1. Atmospheric Environment Service - functional areas

   a) collection of weather data
   b) weather analysis
   c) weather forecasting
   d) applied meteorology
   e) ice movement data
   f) atmospheric research
   g) air quality surveys
   h) weather modification
   i) noise propagation
   j) instrument design and development

### Environmental Protection Service (EPS)

EPS is responsible for dealing with problems of the Canadian environment which fall within IDOE's terms of reference. It is also the public's point of contact with the Department on matters of environmental protection. It develops and enforces environmental protection regulations and other instruments used in implementing federal laws relating to the environment. It also serves as an advisory body to other federal departments administering legislation under which environmental regulations are developed.

Functional areas

1. Water Pollution Control
2. Air Pollution Control
3. Ecological Protection

    a) Ecological impact control
    b) Noise control
    c) Environmental contaminants
    d) Solid waste management

4. Environment Emergency

    a) National Emergency Equipment Locator System (NEELS)
    b) National Analysis of Trends in Emergencies System (NATES)
    c) Centre of Spill Technology (COST) at Canada Centre for Inland Waters (CCIW), Burlington, Ontario

5. Federal Activities Protection
6. Regulations, Codes and Protocols

Inland Waters

1. Water Resources - occurrence and movement of water
2. Water Quality - monitoring, surveys
3. Water Planning and Management - water resources planning, programs under Canada Water Act, international water matters.
4. CCIW - national water research and survey institute

Canadian Forestry Service

1. International forestry activities
2. Environmental concerns

    a) impact of forestry practices, forest cover manipulation

3. Protection of the Forests

    a) insect pest control
    b) forest fire detection

4. Growing and harvesting trees
5. Industrial use of wood
6. Resource appraisal
7. Information services

Canadian Wildlife Service

1. Migratory Birds - conservation and management
2. Mammalogy
3. Environmental impact studies

4. Land acquisition - wildlife habitats
5. Toxic chemicals studies, etc.
6. Pathology, etc.

Lands Directorate

1. Land Evaluation and Planning - classification and inventory
2. Land use studies and planning

Planning and Finance

1. Policy, Planning and Evaluation
2. Liaison and Coordination
3. Finance and Facilities
4. Personnel
5. Computing and Applied Statistics
6. Office of Science Advisor
7. Information

ADVISORY BODIES

Advice from the public sector is provided directly to the Minister and Deputy Minister by a Canadian Environmental Advisory Council, separate Fisheries and Forestry Advisory Councils, and the Fisheries Research Board. These advisory bodies review programs, assess their effects, and provide links with organizations outside the government. The councils include prominent Canadians from the scientific community, the interested public, and the Department.

The Environmental Assessment Panel manages, on behalf of the Minister of the Environment, the preparation and review of formal detailed environmental assessments and protection statements. It defines requirements in respect of general baseline environmental conditions for areas in which proposed actions are contemplated. It also provides advice and guidelines to proponents undertaking environmental assessments and assists the proponents in the incorporation of environmental designs and procedures to implement its findings.

The Fisheries and Forestry Advisory Councils are active in the various resource fields of interest to the Department.

## ENVIRONMENT CANADA LIBRARY FUNCTIONS

Agatha Bystram, Director, Library Services

Environment Canada's Libraries are made up of several collections from coast to coast. The Headquarters Departmental Library is in Place Vincent Massey, Hull, Quebec. This library was formed in 1972 by the amalgamation of the Forestry, Fisheries, Water Management, and Wildlife Libraries. The Headquarters Library responsibility is to serve the library users of the capital region (Ottawa/Hull) in the range of management functions and to provide functional guidance and support services to the regional libraries. These establishments, at the present time, number close to 50. For the purposes of a possible document exchange between NOAA and Environment Canada, the following are relevant:

Fisheries Research, Vancouver Laboratory - Vancouver
Marine Sciences Directorate - Victoria
Pacific Biological Station - Nanaimo, B.C.
Freshwater Institute - Winnipeg
Canada Centre for Inland Waters - Burlington
Atmospheric Environment Service - Downsview
Arctic Biological Station - Ste. Anne de Bellevue
Maritimes Regional Library - Halifax
Fisheries Research, Halifax Laboratory - Halifax
Bedford Institute - Dartmouth, N.S.
Fisheries Research, Biological Station - St. Andrews, N.B.
Fisheries Research, Biological Station - St. John's, Nfld.
Fontaine Library - Ottawa

Because the libraries became part of the Department of the Environment only recently, most of the regional libraries can still be distinguished by the traditional subject profiles--Forestry, Fisheries, Wildlife, Oceanography and Water Science, and Atmospheric Environment or Meteorology. The new Environmental Protection Service has not established new libraries but obtains services from the existing collections. At present, our effort is to organize all the establishments in a network with strong regional centers coordinating technical services, and the Headquarters Library coordinating subject collection areas. The only up-to-date directory to Federal Government Libraries was published by the National Library in 1974. This is Volume 1 of the Canadian Library Directory listing of all Federal Government Libraries with the size of the collection, services provided, and important subject areas. It can be obtained from Information Canada, catalogue number SN3-31/1974.

The Departmental Library's functions include literature searches, SDI, and scientific technical referral services. The Library presently has access to the following data bases, which are available for on-line computerized literature searches:

Q/L SYSTEMS DATA BASES

ENV - 16,200 references and abstracts prepared by the Inland Waters Div. of Environment Canada; from 1969/70 - 1975.

INFORM - references and abstracts 23,664 from 300 business publications; from Aug. 1971 - Dec. 1974.

METADEX - a test data base of 26,159 references from Metals Abstracts prepared by the American Society for Metals; from Jan - Dec. 1974.

NEWS - 38,927 headlines from the clipping file of Environment Canada; from 1970 - 1975.

OAB - 35,842 references from Ocean Abstracts; from 1970 - 1974.

PAB - 33,666 references from Pollution Abstracts; from 1970 - 1974.

RSC - A consolidation by the Dept. of Justice of the Federal Statutes to July 1, 1974, excluding treaties and consolidated acts.

WAA - 35,447 references and abstracts from World Aluminum Abstracts.

CAN/OLE (CANADIAN ON-LINE ENQUIRY) DATA BASES

BA - Biological Abstracts. 797,739 references; from Jan. 1972 - April 1975.

CAC - Chemical Abstracts. 390,774 references; from Mid-1973 - Sept. 1974.

EI - Engineering Index. 365,037 references; from Jan. 1970 - Dec. 1974.

INSPEC - Information Services in Physics, Electro-technology, Computers, and Control.

UNION - The Union List of Scientific Serials in Canadian Libraries.

Coordination of documents exchange is another important task assigned to the libraries. At the present time, Departmental publications are mostly hard copies, but a study of adopting microform for Departmental publications is now being undertaken. A considerable portion of the publications is published through Information Canada and copyrighted by that agency. Aside from a few commercially published items, the rest of the documents are published by the Department. Possibly the most comprehensive exchange accepted by the Department is with the Environmental Protection Agency where one copy of all Environment Canada English language publications is sent in exchange for the EPA microfiche collection. The exchange includes

all bibliographic tools, indexes, and translations aside from the documents published by the five services.

The libraries also coordinate translation services. Scientific and technical materials are translated from all languages except French, which is one of the official languages of Canada. Translations are done by the offices of the Secretary of State. The Departmental Library stores, indexes, and loans translations originating with Environment Canada.

## THE ATMOSPHERIC ENVIRONMENT SERVICE

T. Lloyd Richards, Chief, Hydrometeorology
and Marine Applications Division

The Atmospheric Environment Service (AES) of Environment Canada and the meteorological components of the National Oceanic and Atmospheric Administration, U.S. Department of Commerce, have much in common. Located in neighboring countries, each is responsible for providing a national weather service and a national climatological service together with supporting research, instrument, and administrative services. Channels of communication, whether arranged through the World Meteorological Organization or through bilateral agreements have had to be good, and the exchange of "real-time" meteorological information must be reported as excellent. The National Meteorological Center, Washington, is a World Centre for the WMO World Weather Watch; the Canadian Meteorological Centre, Montreal, is a Regional Centre. An electronic pipeline linking the computer systems of these centres operates 24 hours a day carrying a continuous flow of data and analyses.

The Atmospheric Environment Service "Blue Book", which is available to all participants, outlines in a few pages the objectives, organization. and activities of AES. For the purpose of this overview attention is drawn to The AES Objectives, and AES Organization Chart. In expanding on the latter within the context of this Workshop, several areas should be noted.

The Information Services shown as staff support are primarily responsible for public relations with the news media and for internal house organs.

The Field Services Directorate provides a national weather service through its regional offices. This Directorate is responsible for the observing networks and production and dissemination of forecasts; its local weather offices also provide the first point of contact with the users of all AES services, including climatology and consultation related to the application of meteorology to other problems.

The Central Services Directorate is responsible for the Training and Ice programs and for a large component known as Meteorological Applications Branch. Training is at both the technician and professional levels. The Ice program includes ice observations, extensive aerial reconnaissance, and ice forecasting in aid of marine navigation. The Meteorological

Applications Branch is of special interest to this workshop in that it is responsible for computer processing and quality control of current climate data, the analyses, publication and archiving of these data, and the provision of data and information to the user. Appendices A and B describe these activities in greater detail. This Branch also has the national centres of competence for the application of meteorology to problems concerned with agriculture, transportation, construction, tourism, northern development, water resources management, and the fresh-and salt-water environment.

The Atmospheric Research Directorate has three major branches. The one that generates the data and information of most interest to this group is the Air Quality and Inter-Environmental Research Branch. Its responsibilities also include basic studies on noise pollution. This Directorate took the lead for AES in the recent WMO-GATE program.

To complete the organization chart we have the Instrument and Administration Branches. Of utmost importance to the Workshop is the Library (under Administration) which serves as the meteorological component of the National Science Library and includes 100,000 books, journals, papers, etc., with access to many more through the Intra-Library Loan Service. The AES Librarian, Miss Skinner, is participating in this Workshop.

In summation, AES has major environmental data, information, and library resources. In most cases excellent channels of communication with NOAA have been created under the aegis of WMO or through bilateral agreements. We are pleased to have the opportunity to meet with representatives of both NOAA and EPA and to take part in this informal forum to discuss possible additional exchanges of specialized data and other information resources.

## THE AES OBJECTIVES

IN RECOGNITION OF ITS ROLE WITHIN THE DEPARTMENT OF THE ENVIRONMENT, THE AES HAS SET OUT IN BROAD TERMS A STATEMENT OF OBJECTIVES WHICH REFLECT BOTH LONG STANDING AND NEWLY ASSIGNED COMMITMENTS AND ARE FULLY COMPATIBLE WITH THE OBJECTIVES OF ENVIRONMENT CANADA.

AES OBJECTIVES ARE:

1. TO CONTRIBUTE EFFECTIVELY TO IMPROVING THE NATIONAL ECONOMY, ENHANCING THE ENVIRONMENT, AND RAISING THE QUALITY OF LIFE BY:
   - PROVIDING ATMOSPHERIC AND ICE INFORMATION SERVICES
   - PROMOTING THE APPLICATION OF SUCH INFORMATION
   - ADVANCING KNOWLEDGE OF THE NATURE AND BEHAVIOUR OF THE ATMOSPHERE AND OF ICE IN CANADIAN WATERS:
2. TO PROMOTE CANADA'S NATIONAL ATMOSPHERIC INTERESTS IN THEIR INTERNATIONAL DIMENSION.

Figure 1

**AES ORGANIZATION CHART**

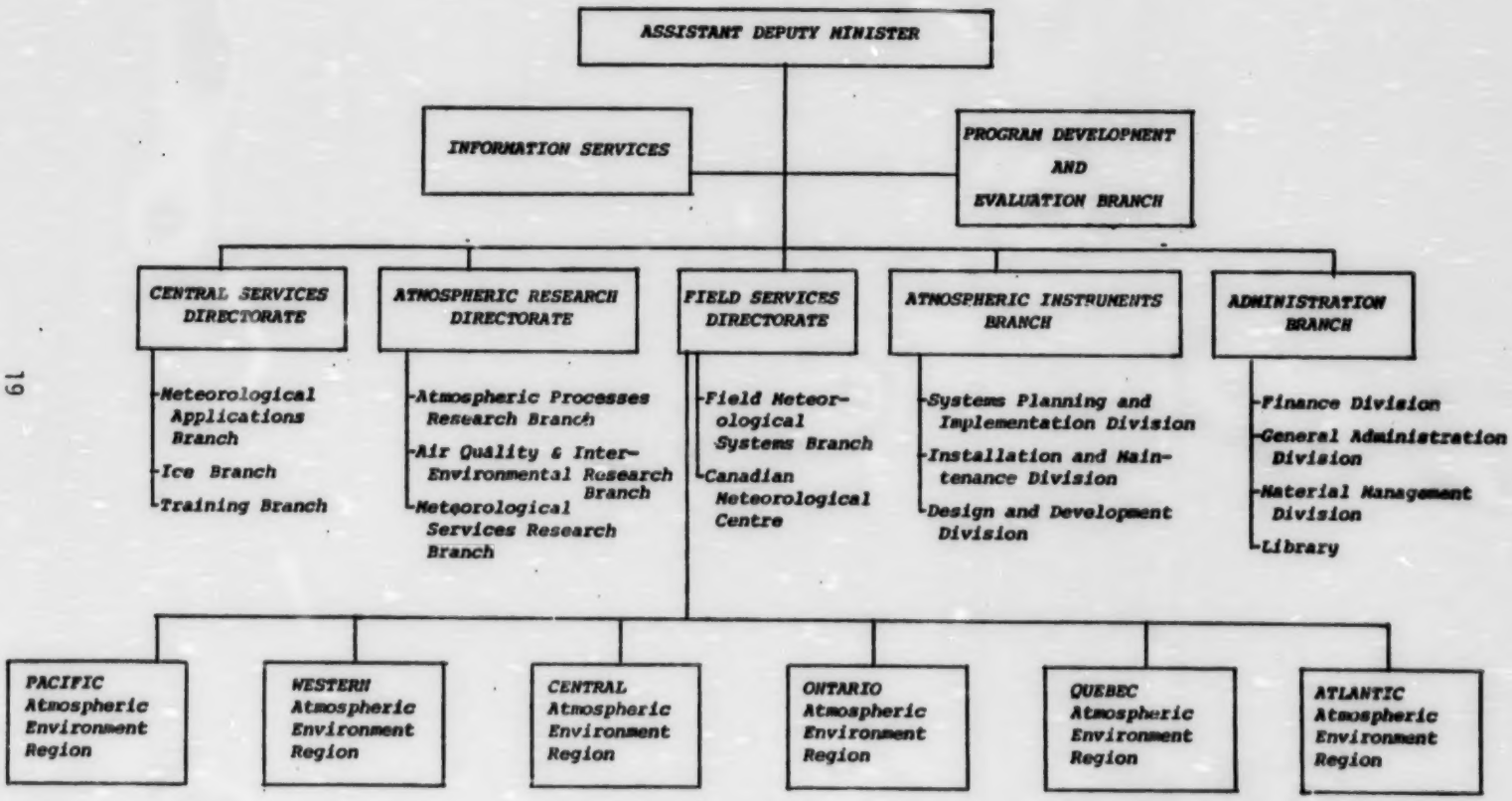


Figure 2

Appendix A

Atmospheric Environment Service

CLIMATOLOGICAL DATA SERVICE

## Introduction

The Atmospheric Environment Service (AES) has custody of one of Canada's most valuable sources of information, namely the archives of weather data covering a period of over 125 years. A prime objective of the Service is to make these data readily available to anyone in a form appropriate to decision-making. Towards this goal, the Meteorological Applications Branch of the AES operates a Computing Centre which has the responsibility for:

(a) maintaining computer processible archives of all Canadian climatological data,

(b) developing improved data processing methods in response to national requirements, and

(c) providing specified service bureau tasks.

The purpose of this short report is to summarize the climatological data and services available from the Computing Centre.

## Contents of Archives

The Canadian archives of climatological data contain over 100 million records. While the punched card is still the basic data entry medium into the climatological processing system, about 80% of the archived data are now stored on magnetic tape (800 bpi, 9 track) in card image format. This percentage is growing rapidly and, by 1978, it is expected that the complete archives will be stored on magnetic tape.

Two important points should be noted about these archives. First, the data are quality controlled: and second, they are processed soon after being received. Therefore, the records are as up-to-date as possible.

Some 25 different record types include all weather elements. The time scale ranges from hourly to monthly. A list is attached.

## Archive Services

Placement of these data on magnetic tape has made the archive service readily available for climatological applications studies, for determining statistics, for correlation studies, and for specialized tabulations.

The Computing Centre actively encourages user reference to these archives by providing the following services:

(a) direct copy of the data archives contained on magnetic tape or punch cards,

(b) developing and applying a family of "utility" programmes which relates to a wide range of request, requires little set-up time and provides a self-explanatory output,

(c) custom programming to satisfy user requirements,

(d) producing routine tabulations of popular climatological information for publication and file reference, and

(e) processing archived climatological data using computer programmes supplied by the user.

Users of these services can be broken down into several distinct categories; AES research projects, other federal and provincial agencies, universities, engineering consultants and international data exchange under WMO. Many requests for these services have come from the United States.

As it is government policy to recover the cost of any project, users are charged for services provided by the Computing Centre. Such charges also provide a reasonable control on the extent of requests.

Relationship with National Climatic Center (NOAA)

Over the last 25 years there have been frequent exchanges of climatological information between the AES Computing Centre and the National Climatic Center (NCC) of NOAA. Indeed the NCC has become the first point of enquiry within NOAA regarding the availability of climatological data for Canada.

The provision of information to the NCC and other U.S. agencies has been facilitated by the development of several specialized programmes to convert data formats from those used by one nation to those of the other. As an example, the NCC possesses an extensive file (almost 14 million cards) of Canadian upper air data for the period 1955-73.

A prime example of the exchange of climatological information is the marine data for the Great Lakes and for the east and Arctic coastal waters supplied by the NCC in the form of validated data files and SSMO (Summary Surface Meteorological Observations) tables. There have been other exchanges in support of international research programmes such as the GARP Atlantic Tropical Experiment, and the International Field Year for the Great Lakes (IFYGL). In the case of IFYGL, two data banks have been established to facilitate data exchange, one with the NCC in Asheville, N.C., and the other with the Canada Centre for Inland Waters in Burlington, Ontario.

## RECORD TYPES

| NUMBER | DESCRIPTION |
|---|---|
| 1 | Hourly Surface Observations |
| W3A | Recording Precipitation Gauge Work Card |
| 3 | Recording Precipitation Gauge |
| W4 | Summary for Climatological Day |
| 4 | Summary for Climatological Day |
| 5 | Standard Pressure Data |
| 6 | Upper Winds |
| 7 | Radiosonde Special Data |
| 8 | Significant Level Data |
| 9 | Marine |
| 10 | Daily Sunshine |
| 11 | Hourly Radiation |
| 12 | Soil Temperature |
| W13 | Evaporation Work Card |
| 13 | Daily Evaporation |
| 14 | National Air Pollution |
| 14-A | Municipal Air Pollution |
| 15 | Hourly Wind Data |
| 16 | Freeze-up and Break-up |
| 17 | Agrometeorological Data |
| 18 | General Upper Air Card |
| W19 | Ozone Work Card |
| 20 | Radiosonde Special Data |
| 21 | Fischer & Porter - Precipitation Gauge |
| 22 | Hourly Wind in Degrees |
| 23 | Ice Atlas |
| 24 | Mars |
| 25 | Deep Water Wave |
| 31 | Time and Cost Card |
| 33 | Any Card Type assigned for special projects |
| 35 | Program Punching |
| S-4-1 | Climate Monthly Summary |
| S-4-2 | Climatological Monthly Summary Card |

Appendix B

## EXCHANGE OF PUBLICATIONS

### I. Exchange of Publications with NOAA (National Climatic Center)

#### Routine AES Publications

Monthly Record - Meteorological Observations in Canada
Monthly Bulletin - Canadian Upper Air Data
Canadian Weather Review
Ozone Data for the World
Supplementary Precipitation Data
Monthly Radiation Summary
Daily Agrometeorological Data (discontinued September 1973)
Arctic Summary (discontinued with July-December 1971 issue)
Meteorological Tower Bulletin
Snow Cover Data

#### Non-Routine AES Publications

Technical Memoranda, Canadian Meteorological Research Reports and Canadian Meteorological Memoirs (W. Wilson - ACTF)
Climatological Studies
Climatic Normals
CLI Circulars
Climatic Data Sheets
Documentation Sheets
Bibliographies
Atlas of Climatic Maps

#### Publications Received From NOAA - NCC

Northern Hemispheric Data Tabulations (Monthly) - Microfilm
Weekly Weather and Crop Bulletin
Local Climatological Data (Monthly, Annual)
Climatic Data (Monthly, Annual)
National Summary (Monthly, Annual)
Climatic Data for the World (Monthly)
Average Monthly Weather Outlook (twice monthly)
Numerous non-routine publications are also received such as:
World Wide Airfield Summaries
Temperature and Precipitation Normals
Heating Degree-Day Normals
Climatic Atlas of the U.S.A.

### II. Information

On request, supply microfilm or photostats of climatological data.

#### A GENERAL PRINCIPLE

On a complimentary basis, provide climate publications and data to foreign meteorological services. This includes U.S.A.

# FISHERIES AND MARINE SERVICE*

R.M. McMullen, A/Director, Policy and Program Evaluation Branch,
Ocean and Aquatic Sciences

## HISTORICAL BACKGROUND

The importance of the fisheries to Canada's economy and development was recognized from the earliest days of our nation's history. This was so, not only because of the industry's impact on employment and the export trade, but because of the extensive international negotiations required to resolve fisheries problems.

At the time of Confederation in 1867, Canada's founding fathers attached sufficient importance to the maritime interests of the new Dominion that they deemed it necessary to establish a government department for the protection and development of those interests. This was known as the Department of Marine and Fisheries and incorporated the Fisheries section of the Crown Lands Branch of the old Canada (i.e., Ontario and Quebec).

The Fisheries Act, under which the new Department was created, was given Royal Assent on May 22, 1868. Among its provisions were the establishment of a staff of federal fishery officers, introduction of federal fishing licenses and leases, closed seasons for salmon and other major species, and prohibition of water pollution. These antipollution measures, built into the Fisheries Act more than 100 years ago, have been used very effectively to curb industrial pollution in the last few years, since environmental issues began to assume significance in Canada.

It is interesting to note the range of subjects for which the early Department of Marine and Fisheries was responsible. They included: sea coast and inland fisheries, Trinity Houses, Trinity Boards, pilots, pilotage, beacons, buoys, lights and lighthouses, harbours, ports, piers, wharves, steamers and vessels belonging to the Government of Canada (except gun-boats or other vessels of war), harbour masters, examination and granting of certificates to masters and mates, inspection of steamboats, enquiries into causes of shipwrecks, maintenance of steamboats, maintenance of marine and seamen's hospitals, care of distressed seamen, and "generally such matters as refer to the marine and navigation of Canada".

Since 1868 the Fisheries Department has undergone many changes, although its primary role and objectives have continued unchanged. To run quickly through the history:

1904: Hydrographic work of the Department of Public Works of Railways and Canals transferred to the Department of Marine and Fisheries;

1914: Fisheries transferred to the newly formed Department of Naval Service;

*Revised version of the talk given in May as a result of organizational changes that come into effect in the summer of 1975.

1920: Department of Fisheries and Marine separated from the Naval Service;

1930: Creation of the Department of Fisheries (the Marine section, which also became a separate department, was incorporated into the Department of Transport in 1936);

1968: Fisheries and Forestry amalgamated into one department (irreverently known as the Dept. of "Fish and Chips");

1971: Creation of the Department of the Environment, joining Fisheries with other environment-oriented groups within the government:

1974: Appointment of a Minister of State for Fisheries, with special responsibility for the Fisheries and Marine Service within Environment Canada.

With an employee force of approximately 4,760 and a budget in the current year (1975-76) of $208 million, the Fisheries and Marine Service is headed by a Senior Assistant Deputy Minister and represents approximately 50 per cent of the Department of the Environment's (DoE) entire financial and manpower resources. The other "half" of DoE is grouped under the umbrella title of Environmental Services and is also headed by a Senior Assistant Deputy Minister.

The Fisheries and Marine Service is responsible for a broad range of programs related to the aquatic environment and the living resources of the ocean and inland waters. In summary, these include:

- management of Canada's ocean and inland fisheries;
- hydrographic surveying and charting of navigable coastal and inland waters;
- administration of small craft harbours:
- fisheries and oceanographic research contributing to the understanding, management, and optimum utilization of renewable aquatic resources and marine waters;
- research in support of international agreements related to fisheries management and marine environmental quality.

The federal government has exclusive legislative jurisdiction over Canada's fisheries in coastal and inland waters, but some provinces have been delegated administrative responsibilities in varying degrees. These include Ontario, Manitoba, Saskatchewan, and Alberta, where the management of all fisheries is a provincial responsibility. In Quebec, the provincial government manages both marine and freshwater fisheries, although the inspection of fish and fishery products for trade outside the province remains with the federal government. In British Columbia, the fisheries

for marine and anadromous species are managed by the federal department, but the provincial government manages freshwater fisheries.

Most of the functions of the Fisheries and Marine Service are grouped under two major units, Fisheries Management and Ocean and Aquatic Sciences, each headed by an Assistant Deputy Minister reporting to to the Senior Assistant Deputy Minister, Fisheries and Marine Service. Coordinated by a small corps of senior staff officers at headquarters in Ottawa, the Service carries on most of its programs at regional and field locations from coast to coast. Regional directors-general for the Service are based at Victoria, B.C.; Vancouver, B.C.; Winnipeg, Manitoba; Burlington, Ontario, Quebec City, Quebec; Halifax, N.S.; Dartmouth, N.S.; and St. John's, Newfoundland.

There are, however, three other functional units -- Small Craft Harbours, Recreational Fishing Policy, and International Fisheries and Marine Policy which report directly to the Senior Assistant Deputy Minister, in addition to several central groups in headquarters.

The International Fisheries and Marine Directorate is the focus for development of departmental policy in the international field and is responsible for the conduct of negotiations in support of Canada's international fisheries and marine initiatives. These negotiations are conducted in close collaboration with the Department of External Affairs. Of particular importance is the organization of Canadian participation in 11 international commissions, and arrangements under 10 other international agreements concerned with management of Canadian fisheries under international regulation and for protection of the marine environment. At the present time, the Directorate is playing a key role in the development and negotiation in Canada's position in the Law of the Sea Conferences and the ICNAF meetings. The Directorate also provides the departmental input into Canadian fisheries and marine environmental overseas aid programs that are administered through the Canadian International Development Agency and FAO.

To carry out its varied responsibilities in the areas of fisheries conservation and protection, and marine research, the Fisheries and Marine Service operates a sizable fleet of vessels. Fisheries protection vessels, totalling about 80, vary from the 175-foot Chebucto, operating out of Halifax, and the 180-foot Tanu, based in Vancouver, to small launches that patrol coastal and inland waters. There are also numerous research and survey vessels operating in both the deep ocean as well as coastal and inland waters, such as the CCS Hudson (4,800 tons) and the CSS Baffin (4,400 tons). It may be of interest that the Service operates the first submersible mothership designed and built in Canada. That is the 191-foot Pandora II, which operated in the Beaufort Sea in the summers of 1974 and 1975 along with the submersible Pisces IV as part of a multi-million dollar joint project with the oil industry concerned with the environmental impact of offshore drilling for hydrocarbons.

## FISHERIES MANAGEMENT

Fisheries Management programs are directed toward the objectives of ensuring maximum economic and social benefit to Canada from the use of fisheries and other aquatic living resources of coastal and inland waters,

and of maintaining and conserving these resources and the aquatic environment in a healthy productive state.

In pursuit of these objectives, specific programs are carried on in all regions to ensure the conservation, protection and, within the limits of resources available, the development and expansion of fisheries resources; the maintenance of high quality standards for fish and fishery products for human consumption; assistance to fishermen and the industry in the development of new products, and more effective harvesting, production, and marketing methods; provision of a low-cost fishing vessel insurance plan; and administration of a vessel construction subsidy program.

Programs of fisheries research directly supporting national and international fisheries activities are conducted from research stations located in coastal and inland areas. These establishments include fisheries biological research stations at Nanaimo, B.C.; St. Andrews, N.B.; Ste. Anne de Bellevue, Quebec; and St. John's, Newfoundland; and fisheries technological laboratories at Vancouver, B.C. and Halifax, N.S. Research contributing to both Fisheries Management and Ocean and Aquatic Sciences is carried out at the Pacific Environment Institute, West Vancouver, B.C., the Freshwater Institute, Winnipeg, Manitoba, and the Great Lakes Biolimnology Laboratory, Burlington, Ont.

The scope of fisheries research is extremely varied, covering studies in the biology, life history, distribution, body chemistry, and migrations of economically valuable fish and shellfish, the forecasting of fish stock variations and movements, the quality control of fish catches and fishery products, the development and application of aquaculture techniques in salt- and fresh-water, the study of marine animals and their relationship to fish populations, and the calculation of maximum sustainable yields of fish species and stocks harvested in the commercial and recreational fisheries.

## OCEAN AND AQUATIC SCIENCES

Under the broad heading of Ocean and Aquatic Sciences (OAS) are grouped an extensive range of research and survey programs contributing to the understanding and development of both renewable and non-renewable ocean resources, and to the understanding of ecological processes within the aquatic and marine environment as well as the precautions and remedies required to restore and protect that environment and the resources associated with it.

OAS programs are located at Fisheries and Marine Service Institutes, and laboratories across Canada, but principally at the Marine Ecology Atlantic Oceanographic Laboratories (Bedford Institute of Oceanography), Dartmouth, N.S., Ocean and Aquatic Sciences Pacific Region headquarters, Victoria, B.C. (to be relocated in 1978 at a new Institute of Ocean Sciences, Patricia Bay, B.C.), and the Canada Centre for Inland Waters, Burlington, Ont.

Oceanographic activities include, in addition to oceanographic research, the operation of the Marine Environmental Data Service, comprising the

Canadian Oceanographic Data Centre, wave climate studies, tide and water-level measurements, and other related projects.

Ecological and environmental studies related to the marine and aquatic environment are directed primarily toward the control of pollution and the determination of safety margins of contaminants as they affect aquatic life. There is a continuing need for aquatic resource inventories and environmental impact assessments particularly in relation to projects having potential effect upon aquatic life in the ecologically delicate Arctic and in sheltered coastal waters such as the Gulf of St. Lawrence and the Strait of Georgia.

A major responsibility of the Ocean and Aquatic Sciences division is the planning and implementation of a national program of hydrographic surveying and charting of navigable coastal and inland waters. The Canadian Hydrographic Service traces its history back to 1883 when the Canadian government started a survey of Georgian Bay. Their work includes, in addition to standard navigational charts, the production of special charts and maps for pleasure craft, the fishing industry, national defence, and offshore exploration. Publications related to navigation, such as Tides and Current Tables and Sailing Directions, are also produced.

A significant development of recent years has been the increasing use of relatively large-scale, multidisciplinary or interdisciplinary research and survey programs. One example of this has been the Beaufort Sea Program which started in the summer of 1974 and will terminate by the end of 1975. It is a multi-million dollar program, in cooperation with the petroleum industry, intended to provide enough baseline information to enable an assessment to be made of the environmental impact of the drilling which will start there in 1976. Another example is the projected 6-year study of Gulf of St. Lawrence and the Strait of Georgia. This will be the first time in Canada that the total aquatic ecosystem will be studied over such a large area.

## MARINE ENVIRONMENTAL DATA SERVICE

Henry A.C. Jones, Information Officer

The Marine Environmental Data Service (MEDS) of Canada was formed January 1, 1973. This organization, based in Ottawa, is an amalgamation of several data groups that once operated independently within the Ocean and Aquatic Affairs Directorate. These were the Canadian Oceanographic Data Center, parts of the Tides and Water Levels group, the Canadian Wave Climate Study, and the Computer Systems section of the Oceanography Branch.

MEDS has assumed the responsibility of these groups for collecting the several kinds of marine data within the ocean area considered of primary interest to Canada, namely, from 40° to 180°W and from 40°N to the North Pole. For those data collected by countries other than Canada in our area of interest we participate in the World Data Center System for Oceanography. MEDS maintains archives of all data from Canadian Sources irrespective of geographic area.

In concept, MEDS is similar to the National Oceanographic Data Center of NOAA, to whom we are indebted for many of the ideas on ocean data management now incorporated in our Service.

### Products and Services

The sections of MEDS are the Canadian Wave Climate Study, the Tidal Data Section, the Computer Section, and the Oceanographic Data Section. The operations, products, and services of each are described below.

The Wave Climate Study Section measures, processes, and archives data on wind-generated surface waves at various locations around Canada's coasts. Generally, each site is observed for a period of 3 to 4 months, then the instrumentation is moved to a new area. Some sites are subject to on-going monitoring. The purpose of these observations is to establish the worst climate at each site.

Various wave data products can be provided on request. Examples of such products are exceedance diagrams, peak-period histograms, scatter diagrams, and spectrum plots.

The Tidal Data Section uses gages for measuring tides and water levels installed and maintained by regional agencies. Their data are processed and ordered by MEDS. From these data we prepare several series of published data records, some of which are in several volumes according to geographic area. Examples of products of the Tidal Data Section are: water level data; daily, monthly and yearly means, with longer term averages and extremes; Canadian Tide and Current tables; Tide and Water level bench marks.

Several of the gages can be interrogated by telephone; the reply containing recorded information is by simulated voice. Certain gages

are interrogated daily by MEDS through interactive terminals, and their data are automatically transferred to a data base in Toronto, where they are immediately available for on-line inquiry by users.

The Tidal Data Section is responsible for the west coast Tsunami warning gages, which are linked to the Honolulu Tsunami Center, and for a new data base of worldwide tidal harmonic coefficients in support of the International Hydrographic Service.

The Computer Section supports the work of all MEDS sections, since MEDS depends heavily on digital processing for all services and products. The bulk of the work is done on a Control Data Corporation "CYBER 74" which carries our System 2000 data base management package. We also use PDP-10 in Toronto and an IBM 360/85 in Ottawa. Our in-house XEROX 530 presently operates as a high-speed remote batch terminal to the CYBER 74, and in the near future, will also be used for on-line digitizing. One of our PDP-8's is used for driving an 1136 Calcomp plotter, and the other for A/D conversion of instrumented wave data and Cianderaa current meter data.

The computer section is also responsible for all software, and for data base management.

The Oceanographic Data Section, which is the former Canadian Oceanographic Data Center, acquires the physical and chemical oceanographic data from the research programs carried out by the regional institutes in Canada and from the World Data Center Oceanographic section. This section is also the Canadian center for the international exchange of oceanographic data and the International Commission for the Northwest Atlantic Fisheries (ICNAF).

Of the data which flow into the section, those in standard format are processed into computerized data bases; the remainder go into our Data Preservation Archive for safekeeping and future use. We have several data bases at present, two of prime importance. Both of these, the Serial station data base and the Bathythermograph data base, are under System 2000, and are available on-line. These data bases can be interrogated from any point in Canada through either interactive or batch terminals.

The Oceanographic Data Section also supports an in-house computerized retrieval service. Data subsets can be easily extracted using many criteria in complex Boolean combinations. From the extracted data a variety of printer and graphical inventories can be made automatically. The data themselves can be listed, plotted, and in some cases overlaid on computer drawn maps. Some of these products can be made available on magnetic tapes, as well as in the full range of standard media (except discs). The Oceanographic Data Section is also responsible for information in MEDS and is presently trying to find its place in the brave new world of information.

# FISHERIES AND MARINE SERVICE
# SCIENTIFIC INFORMATION DIRECTORATE

Jeff Watson, Deputy Director

Most of the results of Canada's research in the aquatic sciences and fisheries passes through the FMS Office of the Editor where it is evaluated, published, sometimes translated, then documented as part of the permanent knowledge resource for retrieval by secondary access services.

The functions of the Office of the Editor have expanded considerably since the first scientific paper was published by us in 1901 for the Board of Management of the Marine Biological Station of Canada. This was Canada's first aquatic research facility, built in 1899 at St. Andrews, N.B., on a movable floating scow. From this small beginning developed the concept of an independent board to manage research and led to the creation of the Fisheries Research Board of Canada (FRB). Until the 60's FRB publication series were mostly house organs, but as well as fisheries information they contained most of Canada's oceanographic output since oceanographic researchers belonged to FRB until the mid 50's.

The 60's, as in most scientific organizations, was one of explosive growth and expansion into the international field of scientific publishing. A much needed thrust into the computerized retrieval field was approved, but failed to get off the ground before a general economic freeze was applied.

At about the same time the U.S. Bureau of Commercial Fisheries was being reorganized, similar moves were being made in Canada to reorganize research in concert with a newly developing science policy. The FRB ceased to be a separate employer, moved into the public service, and in 1973 became an advisory body. The research stations, together with the Office of the Editor were integrated into the newly formed FMS.

Today more than 95% of FMS scientific output passes through this office, which has become the largest producer of aquatic sciences and fisheries scientific information in Canada. Most matters pertaining to scientific and technical information (STI), handled by other elements prior to the formation of FMS, have now been absorbed. As a result of recent policy decisions we and the Marine Environmental Data Service (MEDS) have been asked to examine the STI area (including data) and to make recommendations on policy and organizational structure. The FRB in its new advisory role also is using its Committee on Scientific Publications and Information to launch a broad background study on the status of STI in relation to aquatic sciences and fisheries. Eventually, we envision a Fisheries and Marine scientific and technical information center in which the Office of the Editor will act as the national focus for non-numerical information. The functions of the non-numerical focus should include the following.

1. Developing policies and approaches for:

a) collecting, processing, storing, retrieving, disseminating, and translating scientific and technical information to maintain improved information management and coordination in the FMS;

b) assessing the quality of scientific and technical evidence generated by the FMS for eventual archiving with the view to evaluating the credibility, relevance, and effectiveness of this resource; and

c) generating and coordinating exchanges of scientific and technical information between the FMS and other countries, institutions, or other knowledge centers that might benefit the development of Canada's fisheries and marine sciences.

2. Acting as the FMS focal point for all matters pertaining to non-numerical scientific and technical information. This includes evaluation of scientific worth; publication production; documentation; information analysis and dissemination; secondary services such as abstracting, indexing and automated retrieval systems; and coordinating translations and exchanges.

Publishing Services

These include editing, publishing, dissemination, and exchange. The following are some FMS publishing activities.

1. The Journal is the world's largest and most frequently cited aquatic science periodical. Thirty percent of authorship is from DoE 30% from the rest of Canada, 30% from the USA and 10% external to North America.

2. We typeset 10,000 pages a year; a further 24,000 are produced in typescript, 12,500 of which are in the FMS Translation series. This series, started in the early 50's is fully indexed, totals 3,500 titles, and is being put on microfiche.

3. The series produced cover a wide range; the Journal, a primary research periodical available in hard copy and on film; Bulletins, which are monographs in aquatic science and available in hard copy and on microfiche; various report series which are mostly typescript; publications of the Canadian Hydrographic Service such as Sailing Directions, Small Craft Guides, Tide Tables, Water Levels--all computer produced; and various Oceanographic report series. All publications will be available on microform in 1976.

4. We have over 1,500 exchanges with 105 countries. Exchanges are agreed upon either at the request of an institute director in Canada or at the request of institutions outside of Canada. These requestors offer their own publications in exchange; 42 such exchanges are made with NOAA locations. One advantage of this pro-

cedure is that decisions on exchanges remain with the publisher and be made solely on the scientific value of the exchange. It also allows us to closely monitor our print runs, make decisions with the minimum of bureaucratic fuss, and help make our operation cost effective.

5. Through our membership in the Council of Biology Editors we have close contact with the major access services such as BIOSIS and CAS, and with NFAIS, ANSI, and ICSU/AB. Our publications largely conform to international standards which facilitates access by the secondary services and improves the primary to secondary information flow.

Specialized Information Services

Our first attempt to expand into the rapidly developing field of computerized retrieval was hampered by austerity measures. Day-to-day problems since then, particularly trying to keep up with the phenomenal increase in business resulting from the various reorganizations, have prevented us from doing more than ensuring that all publications are abstracted, indexed, and handled by the major secondary access services. Within the Department, the Water Resources Document Reference Center (WATDOC) was able to take our material virtually unchanged to launch their Environment file, which now contains a large proportion of FMS material.

Within the last year, we have been heavily involved in preparing for Canada's entry into the FAO/IOC Aquatic Sciences and Fisheries Information System (ASFIS). It seems certain that Canada will join the system. The coordination of Canada's input will be effected through FMS in cooperation with the National Research Council, which has the mandate to develop a National Network of Information Systems, with WATDOC contracted to look after the mechanized phase. We have benefited considerable from NOAA's knowledge and experience gained from membership in ASFIS. I anticipate that we will have many opportunities for bilateral sharing of both knowledge and technical expertise in this very important STI area.

## WATER RESOURCES DOCUMENT REFERENCE CENTRE (WATDOC)

Janice Heyworth, Information Specialist

The Water Resources Document Reference Centre, WATDOC, is operated by the Inland Waters Directorate of the Department of the Environment. WATDOC provides a water resources information system for all Canadian organizations both public and private that have an interest in water resources and related topics. A number of data bases, maintained and operated on a variety of systems, are made available through the Centre.

The primary objective of WATDOC is to provide as complete as possible coverage of water resources information to Canadians. Thus, WATDOC is mainly concerned with building and maintaining Canadian data bases to complement commercially available data bases, since these give scant coverage of

Canadian information. WATDOC's main data base, the WATDOC Environment data base, is kept up-to-date by the cooperative efforts of its participants. Besides the usual bibliographic references to published and unpublished literature, all with fully-searchable abstracts, this data base includes reference to people working in the water resources field, projects, and developments. Input is provided by the Centre through the scanning of Canadian journals or journals in which Canadians are publishing, symposia proceedings, and by participants who provide references to the information they generate. Nearly forty agencies are now participating in WATDOC. These are provincial and federal agencies, universities, and private organizations. A data base of Canadian water resources newsclippings dating back to May 1970 is also maintained. The U.S. commercial data base, Pollution Abstracts, is also supported by WATDOC and is available on-line. Through QL's Shared Information Service other legal, scientific and administrative data bases are also directly accessible to WATDOC members. These include the Federal Statutes of Canada, the British Columbia and New Brunswick Statutes, Oceanic Abstracts, Inform, Metadex, and Aluminum Abstracts. WATDOC is Environment Canada's CAN/OLE (Canadian On-line Enquiry) centre. It provides its participants, on a regional basis, direct access to the CAN/OLE system. CAN/OLE sub-accounts are presently located at the Canada Centre for Inland Waters in Burlington, in Halifax, Nova Scotia, and in our departmental Library

Through agreements with foreign countries for the exchange of scientific and technical information services, indirect access is also provided to a wide range of other environmentally related information centers. For example, the agreement negotiated with EPA provides us with access by telephone or mail to the SWIRS (Solid Waste Information Retrieval System) centre. The next step is to negotiate direct mutual access through teletype terminals to one another's systems.

The following systems are accessible through WATDOC. All are available on-line.

| | | SPONSORED BY |
|---|---|---|
| 1. | Shared Information Service | B.C. Attorney General's Dept.<br>Canadian Medical Association<br>Environment Canada (WATDOC)<br>Federal Justice Dept.<br>QL Systems |
| 2. | CAN/OLE | Canadian Institute for Scientific and Technical Information |
| 3. | NEELS/NATES | EPS of Environment Canada |
| 4. | BADADUQ | University of Quebec |

Through these systems, access is provided to the following data bases.

| | |
|---|---|
| Shared Information Service | Statutes of British Columbia<br>WATDOC Environment<br>WATDOC News<br>Oceanic Abstracts<br>Pollution Abstracts<br>Revised Statutes of Canada<br>World Aluminum Abstracts<br>Inform<br>Metadex<br>Statutes of New Brunswick |
| CAN/OLE | Biological Abstracts<br>Chemical Abstract Condensates<br>Engineering Index<br>Inspect<br>Union List of Scientific Serials |
| NEELS/NATES | National Emergency Equipment Locator System<br>National Analysis of Trends in Emergencies System |
| BADADUQ | Institut National pour la recherche scientifique sur l'eau |

Both the multi-disciplinary nature of water resources and the geographically and organizationally dispersed nature of the generators and users of water resources information in Canada have been taken into account in the design of WATDOC. The task of providing information under such circumstances has depended upon the use of sophisticated telecommunication links. In 1973, nationwide digital data networks made the task economically feasible. Direct data lines to the WATDOC data bases, accessible by any WATDOC user, now exist in Saint John, New Brunswick; Toronto and Ottawa, Ontario; and Vancouver, British Columbia. Users may dial direct to any of these points for access to the data bases.

WATDOC participants provide their own terminals and pay for their telephone link to the nearest communication node. At present, there are about thirty terminal accounts across the country. Access through the Shared Information Service costs $1.00 to sign-on to a data base and $1.00 for every subsequent search. There is no minimum and no base fee.

As the WATDOC network continues to expand, and as more national and international organizations share their data bases, more complete coverage of the world's information can be made available to more users in both our countries.

SUMMARY OF WORKSHOP ON
PUBLIC INFORMATION

Group 1

Participants

| EC | EPA | NOAA |
|---|---|---|
| Bernie G. Brulé | John Acomb | Patrick Hughes (Chair) |
| | Dolores Gregory | Roland Paine |
| | | Doris Stewart |

Mr. Brulé explained that he was reporting to the Director General of Environment Canada's (EC) Information Directorate. He brought samples of various EC pamphlets, brochures, etc., for NOAA/EDS to examine to determine their possible utility or interest to NOAA/EDS.

Ms. Gregory explained the background and history leading up to present meetings and the evolution of "timely information" to "public information."

Mr. Paine provided a brief overview of NOAA's organization and programs, followed by a more detailed discussion of NOAA's Public Affairs programs, products, and services. He provided samples of various publications and releases for consideration by the Canadians.

Mr. Hughes presented an overview of user service information activities of EDS and their relation to NOAA programs. He also provided samples of publications and releases. In addition, he provided copies of the daily digest of articles of interest to NOAA appearing in the Congressional Record and the Federal Register; the digest is prepared by NOAA's Office of the General Counsel.

Mr. Acomb presented an overview of EPA Public Affairs programs.

ACTION ITEMS

Canadian and NOAA/EDS participants agreed to examine sample material provided and identify which, if any, they would like to exchange. They also agreed to provide each other an inventory of these and other possible products in the near future. Contact will be maintained between Mr. Brulé and Mr. Hughes unless or until other contacts are established for bilateral exchange.

Canadian and NOAA/EDS participants also recommended that the main emphasis of any exchange agreement between EC and NOAA/EDS focus primarily on scientific and technical data and information exchange, i.e., the subjects of the other 3 working groups, and that any "public information" exchanges be considered supplementary activities.

SUMMARY OF WORKSHOP ON
LIBRARY AND DOCUMENTATION SERVICES

Group 2

Participants

| EC | EPA | NOAA |
|---|---|---|
| Agatha Bystram | Reba McHugh | Louis Barbalas |
| George Ember | Sarah Thomas | Helen DeVore |
| Mike McMullen | | William Hardy (Chair) |
| Ann Skinner | | George Kahler |
| | | Frances Swim |

Mr. Hardy outlined the extent of publications normally produced and distributed by NOAA, and the mechanisms for announcing and archiving them. Reports and publications produced by NOAA's scientists cover a variety of scientific and technical fields. Originating offices provide for the primary or initial distribution of reports. Most NOAA publications are prepared under contract for input to the National Technical Information System (NTIS) by the preparation of a bibliographic data sheet for each. NTIS establishes prices, banks, makes widespread announcement (every 2 weeks), and makes the publications available in paper copies and microfiche to users.

The limited secondary (free) distribution which, among other aspects involves some exchanges with foreign governments, groups, etc., and the mandatory distribution of NOAA reports as required by law were also outlined.

The NOAA Scientific and Technical Publications Announcement published by ESIC every 2 weeks which announces NOAA publications available from NTIS in a NOAA "package" was described.

NOAA's Science and Engineering News (SEN) program,which involves the preparation and aperiodic release of easy-to-read summaries of selected newsworthy reports to the trade, technical, science, and engineering press, was outlined. Sample copies of bibliographic data sheets, NOAA publications announcements, and SEN's were distributed to workshop participants, and their availability for exchange was considered.

Ms. DeVore described the functions of the NOAA Libraries's Technical Processes Branch in receiving, accessioning,and announcing publications and reports. Aperiodic announcements of accessions are made through the Library Accessions List. Also, NOAA's participation in the Ohio College Library Center was discussed. Such participation provides a user with access to a tremendous number of reports and publications held by the member libraries around the country.

Mr. Kahler described the functions of the Atmospheric Sciences Library as one of the several specialized NOAA libraries in the D.C. area. NOAA's library system and its interactions with other national and international library and information systems were discussed, and possible improvements to the NOAA system through new cooperative agreements were mentioned.

Ms. Swim outlined the NOAA field libraries system of 30 libraries located throughout the U.S. The relation of the field libraries to the NOAA base libraries and the opportunities for the international exchange of publications were discussed. NOAA libraries have developed agreements for the exchange of data and information with a number of foreign countries during past years.

Mr. Barbalas described the Great Lakes Environmental Research Laboratories library, which is strategically located with reference to Canada (Detroit). His cooperation with his Canadian counterparts in the exchange of data and information has existed for some time, a particularly important aspect of the cooperative research being conducted on the Great Lakes Basins by Canada and the United States. He described exchange programs between the two countries in connection with the International Field Year of the Great Lakes (IFYGL).

Conclusions:

It was the concensus of the group that neither Environment Canada nor the United States desires to use a scattergun approach to the exchange of environmental data and information; the exchange should be selective. Several recommendations were made as follows: determine what environmental data and information exchange is now taking place, both formal and informal, between the two countries (free and priced publications); each country provide the other with lists of publications now available for exchange; each agency determine what the other has available that it has input to NTIS; NOAA send EC the NOAA Scientific and Technical Publications Announcement; each agency exchange with the other the indexes of its publications, etc.; EC will determine with what foreign countries it has exchange agreements (Bystram and Ember); what translations are available for exchange; begin studies towards a solution of the copyright problem insofar as environmental data and information exchange between Canada and the United States is concerned; and lay the ground work leading to a subsequent workshop when specific administrative details and guidelines for the exchange can be developed and activated.

## SUMMARY OF WORKSHOP
## SPECIALIZED INFORMATION SERVICES

Group 3

Participants

| EC | EPA | NOAA |
|---|---|---|
| Janice Heyworth | John Connolly | Elaine Collins |
| Cam McNeil | William Grosse | Robert Huff |
| Jeff Watson | Neil Haley | Christopher Noe |
| | Peter Halpin | Milton Rose |
| | Jean Pelligrini | Leslie Scattergood |
| | | James Stear (Chair) |

Discussions in this working group centered around four areas: translations, referral to environmental data files, non-numerical (bibliographical type) data bases, and ASFA/ASFIS.

Translations

Leslie Scattergood outlined the history of the NMFS Translation Program. Milton Rose discussed at length the current translation activities within NOAA. Current exchanges were discussed and summarized. Additional potential areas for cooperation and exchanges were identified as follows:

1. Compilation of glossaries of technical terms encountered in EC and NOAA translations; cooperative publication of glossaries of terms in subject areas of interest to EC and NOAA.

2. Improvement in exchange so that all translations produced in Canada are provided to NOAA.

3. NOAA to provide timely identification to EC of translations in progress or completed by sending bibliographic citation cards to EC. EC will determine use or need of this service.

4. EC translation bureau will investigate ways to improve the present translation notification system between EC and NOAA, to prevent duplication of translations.

5. Possible joint translation of lengthy publications of mutual interest to EC and NOAA.

6. Jeff Watson (EC) and Milton Rose (NOAA) will coordinate joint activities.

Referral and Environmental Data Files

Chris Noe (NOAA) briefed the group on the Environmental Data Index (ENDEX) System. Jeff Watson (EC) will discuss ENDEX with the appropriate people in EC. NOAA indicated that registration of Canadian environmental

data files in ENDEX is of interest, particularly those related to the Great Lakes area. EC would like formats and information on use and content of input to ENDEX so if EC developes a system similar to ENDEX, the Canadian and United States systems will be compatible. Ron Wilson (EC) and Chris Noe (NOAA) will maintain liaison on this matter.

Non-Numerical (Bibliographic Type) Data Bases.

James Stear described the Oceanic and Atmospheric Scientific Information System (OASIS), and Elaine Collins specifically described the Biological and Information Retrieval System (BIRS) and the AQUACULTURE data base. The WATDOC System in Canada was discussed. The following areas for exchange were identified:

1. Both EC and NOAA would like to work toward direct on-line access to each other's retrieval systems. EC expressed an interest in tapes of the BIRS and AQUACULTURE data files. The question was raised as to the duplication of coverage that might exist between the AQUACULTURE data base and the CAIN file of the U.S. Department of Agriculture. NOAA (E. Collins will investigate this question. Both EC and NOAA will want to consider any duplication prior to exchange of information.

2. NOAA will investigate the QL System (used in part for WATDOC) for on-line access and for bibliographic file management. It is suggested that NOAA should approach QL through WATDOC. NOAA will access the QL System on a trial basis to become more familiar with the system.

3. Both EC and NOAA feel that it would be valuable to exchange trainning procedures and ideas on their on-line information retrieval systems. NOAA furnished EC a copy of a video tape on the OASIS system. Janice Heyworth and James Stear will represent EC and NOAA in these areas.

ASFA/ASFIS

Activities relating to ASFA and ASFIS were discussed. Elaine Collins summarized NOAA's activities in this area. No positive conclusions were reached. Pending EC's decision to join in this activity, NOAA will continue to keep EC informed of ASFIS progress. Jeff Watson and Joseph Caponio will represent EC and NOAA in this area.

## SUMMARY OF WORKSHOP ON SPECIALIZED DATA SERVICES

### Group 4

### Participants

| EC | EPA | NOAA |
|---|---|---|
| Fred Harnden | Neil Haley | James Churgin (Chair) |
| Henry Jones | | Maurits deRegt |
| Lloyd Richards | | Bruce Grant |
| | | Eugene Hoppe |
| | | Robert Ochinero |
| | | Malcolm Reid |
| | | Herschel Suits |
| | | Augustine Yao |

After a full day of discussion and exchanges of information on available data services, topics which should be explored in greater detail were itemized. The topics were:

1. Data Base Management Systems (DBMS). Compare and exchange information on the uses of DBMS, advantages, disadvantages and resource requirements, describe current efforts in the use of mass storage devices; computer network and minicomputers; discuss aspects related to computer networks and distributed v. centralized facilities.

2. Explore the possible exchange of information on available data sets using the Environmental Data Base Directory system or other file description system

3. Exchange information on detailed inventories of available data archives.

4. Compare current grid co-ordinate systems and the feasability of standard conversion methods between them.

5. Explore the possibility of mixing numeric and non-numeric systems for retrieval of common information.

6. Design a uniform method for exchange of information on available computer applications programs.

7. Examine the relationships between fisheries and marine environmental data.

8. Describe experiences with the use of contractors for consulting, systems analysis, programming, and data processing.

All items were considered to be topics that will require future meetings and discussions to fully develop and implement. Several information items which could be exchange through correspondence were also discussed. These are:

1. Exchange of users guides to data products and services.

2. Interchange of information for various programs, such as climatic data for predicting crop yields and marine data from Canadian Beaufort Sea Program for BLM studies.

3. Exchange of information on the Canadian Center for Remote Sensing and the U.S. plans for SEASAT and TIROS-N.

It was also suggested that the workshop organizers publish a list of key people (points of contact) for various aspects of exchange so that intersession communications could continue in an organized fashion.

The consensus of the group was that future meetings on a continuing basis would be quite useful in improving co-operation between the nations involved.

INFORMAL MEETING
OF
UNEP/IRS NATIONAL FOCAL POINTS

Participants

| EC | MEXICO | NOAA |
|---|---|---|
| George Ember | Rosa Maria Logono de Sainz | Melvin Day |
| Agatha Bystram | Alessandro Bekar | Joseph Caponio |
| Bernie Brulé | | Sarah Thomas |
| | | Dolores Gregory (Chair) |
| | | James Stear |
| | | Robert Huff |
| | | Helen DeVore |
| | | Peter Halpin |

An informal meeting on the status of the International Referral System (IRS) National focal points was held May 30,. 1975, in Washington following the Third U.S.-Canada Environmental Information Workshop. Three National focal points were represented--Canada, Mexico, and the United States.

The purpose of the meeting was to share ideas of development of focal points to serve both national needs and the international community. Topics discussed included:

Plans for National focal points
Opportunities for cooperative assistance
IRS focal point management seminar

Canada and the United States reviewed the status of focal point operations including plans for national inventories of environmental information sources to be registered with IRS. Appendices 1 and 2 are summary reports on Canada and U.S. National focal points, respectively. Mexico, which is developing an environmental information program with the assistance of PAHO and UNDP, has not yet begun IRS Focal Point operations.

The three countries agreed to assist each other in implementing IRS. Each focal point will keep the others informed of its plan and operations, procedures for IRS input will be compared, and ideas exchanged on the management aspects of the referral service.

Cooperative assistance might include, for example, Canadian guidance on identification and coding of sources in exchange for U.S. assistance in preparing machine readable files, or temporary assignment of a Mexican to the U.S. National focal point for experience in developing a national referral system.

In discussing the forthcoming UNEP-sponsored IRS management seminar, the concensus was that Mexico, site of the UNEP liaison office, would be more appropriate than Washington for the initial meeting. The suggestion will be relayed to the UNEP with assurances that both Canada and the U.S. would actively participate in planning and organizing the Seminar.

## Appendix 1: -- UNEP/IRS NATIONAL FOCAL POINT

### CANADA

The IRS National focal point for Canada was established in March 1973 in the Canada Institute for Scientific and Technical Information, a division of the National Research Council of Canada. Since that time, the following four tasks were accomplished: (1) English and French versions of an "Information Source Registration Form" were designed in collaboration with the U.S. National focal point; (2) a data gathering pilot study was carried out during which input was solicited from 700 potential registrants; (3) "Organizational Participant" status was established with the Department of Environment and with other departments of the federal government: (4) an initial manual file was built up to be submitted as the first batch of Canadian input to the central IRS Directory in Nairobi.

As of today a total of 461 input forms were received, processed and numerically coded according to the final organizational subject attribute lists. This initial file identifies 301 governmental (federal, provincial, municipal), 134 academic and 26 industrial information sources. Further data gathering in 1975 and 1976 is now in the preparatory stage; the completion of the Canadian file (estimated at approximately 4,000 input forms) has been projected for late 1976 or early 1977.

As in the past, Canada intends to maintain a close working relationship with the U.S. focal point in EPA. For this purpose, consultative meetings and the sharing of methodologies and techniques are planned.

The Canadian National focal point expressed interest and offered participation in the planning and organization of the forthcoming UNEP-sponsored IRS management seminar to be held in Washington or in Mexico City.

## Appendix 2 -- UNEP/IRS NATIONAL FOCAL POINT

### UNITED STATES

The Environmental Protection Agency has been designated by the Department of State as the U.S. National focal point.

The focal point, established as a part of the EPA Library Systems Branch, will comprise a staff of five, including a Director (now being recruited). The official opening of the center is scheduled for early October 1975.

Until EPA was designated the U.S. focal point, a subcommittee of the State Department Committee on International Environmental Affairs (CIEA), under the chairmanship of Melvin S. Day, served as focal point. The interagency committee will continue to advise the State Department and EPA on IRS.

As a first step in the national inventory for input into IRS, the National Oceanic and Atmospheric Administration (NOAA) and EPA conducted

a pilot project for collecting sources of environmental information in the two agencies. Information collected on some 36 sources will serve as the initial input for the IRS. Other agencies will conduct similar surveys of potential sources to be registered with the IRS.

Surveys of Federal Government information sources will be followed by inventories of sources under State and local Governments, industry, university, and other private sector sources. Professional and trade associations will be used as channels in collecting private sector sources.

Close cooperation is expected between the U.S. focal point and the National Referral Center, Library of Congress, as well as other agencies represented on the State Department advisory committee.